**Comparative Analysis of Simultaneous Transcranial Doppler and Cerebral Perfusion Computed Tomography for Cerebral Perfusion Evaluation in TBI Patients**

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**Abstract:** The aim was to investigate the feasibility of simultaneous comparison of the circulation in major and minor cerebral vessels, using perfusion computed tomography (PCT) and transcranial Doppler (TCD) in patients with traumatic brain injury (TBI), cerebral vasospasm (CVS) and intracranial hematomas (ICH). *Methods:* 230 TBI patients with mean age of 35.5±14.8 years were treated at the Nizhniy Novgorod Regional Trauma Center in 2012–2017. The patients were divided into three groups: 1) diffuse TBI without ICH (75 patients); 2) TBI with CVS (50 patient); and 3) TBI with ICH (95 patients). Assessment of cerebral blood flow volume (CBFV) using PCT in both middle cerebral arteries (MCAs) was performed immediately followed by TCD to provide consistent conditions for the study of CBF. *Results:* In the group 1 the CBFV had statistically valid, expressed correlations with the linear CBF (p < 0.05 on the left; p < 0.001 on the right). In the group 2, correlation analysis has not reveal any significant correlation between the values of the CBFV in the temporal lobes and the CBF in the MCA. In the group 3 the correlation analysis has not revealed any reliable correlations between the CBFV and the CBF neither on the side of the removed ICH nor on the opposite side. The patients in group 2 showed the negative significant correlation between the CBFV and CBF in the region of the removed ICH (p < 0.05). On the opposite side of the brain no significant correlation has been revealed between these parameters. *Conclusion:* The development of these phenomena is an after-effect of serious disturbances of cerebral autoregulation.

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